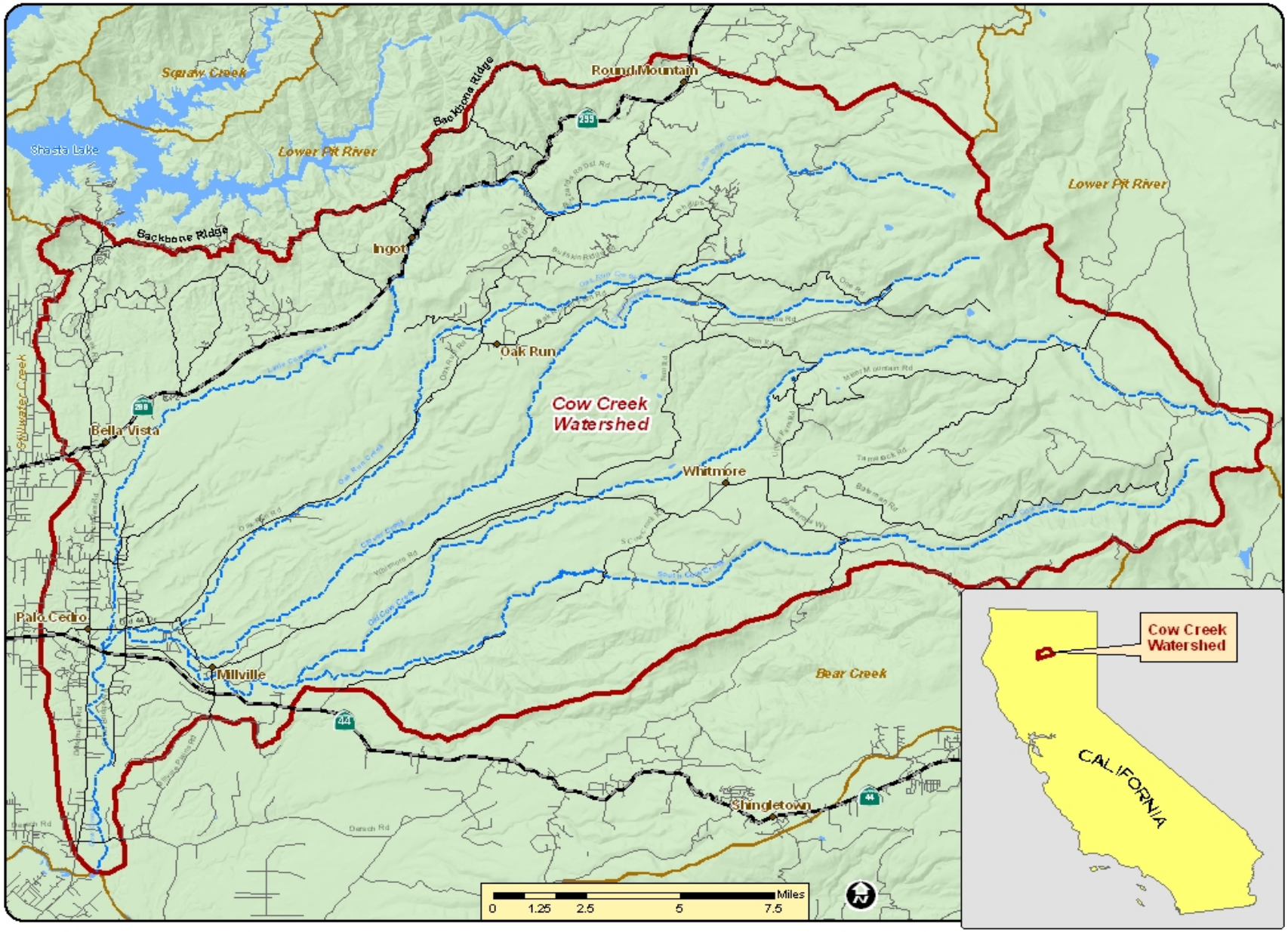
Cow Creek Watershed Williamson Tailwater Pond

A Working Model
For Improved
Water Quality

Mike Harris
WSRCD

The Cow Creek Watershed



Cow Creek Watershed

- 274,684 acres
- 5 sub watersheds
- 164.4 miles of stream
- Land Use
  - 1/3 Rural Residential
  - 1/3 Agriculture
  - 1/3 Timber

Cow Creek Watershed Management Group

- CCWMG, a group of concerned landowners and businesses, who have organized with the goal of enhancing the watershed while maintaining viable timber and agriculture industries and the rural way of life.
- Formed in 1999 to provide a forum for local input into the watershed's future and to bring grant funding into the watershed for increased environmental Quality

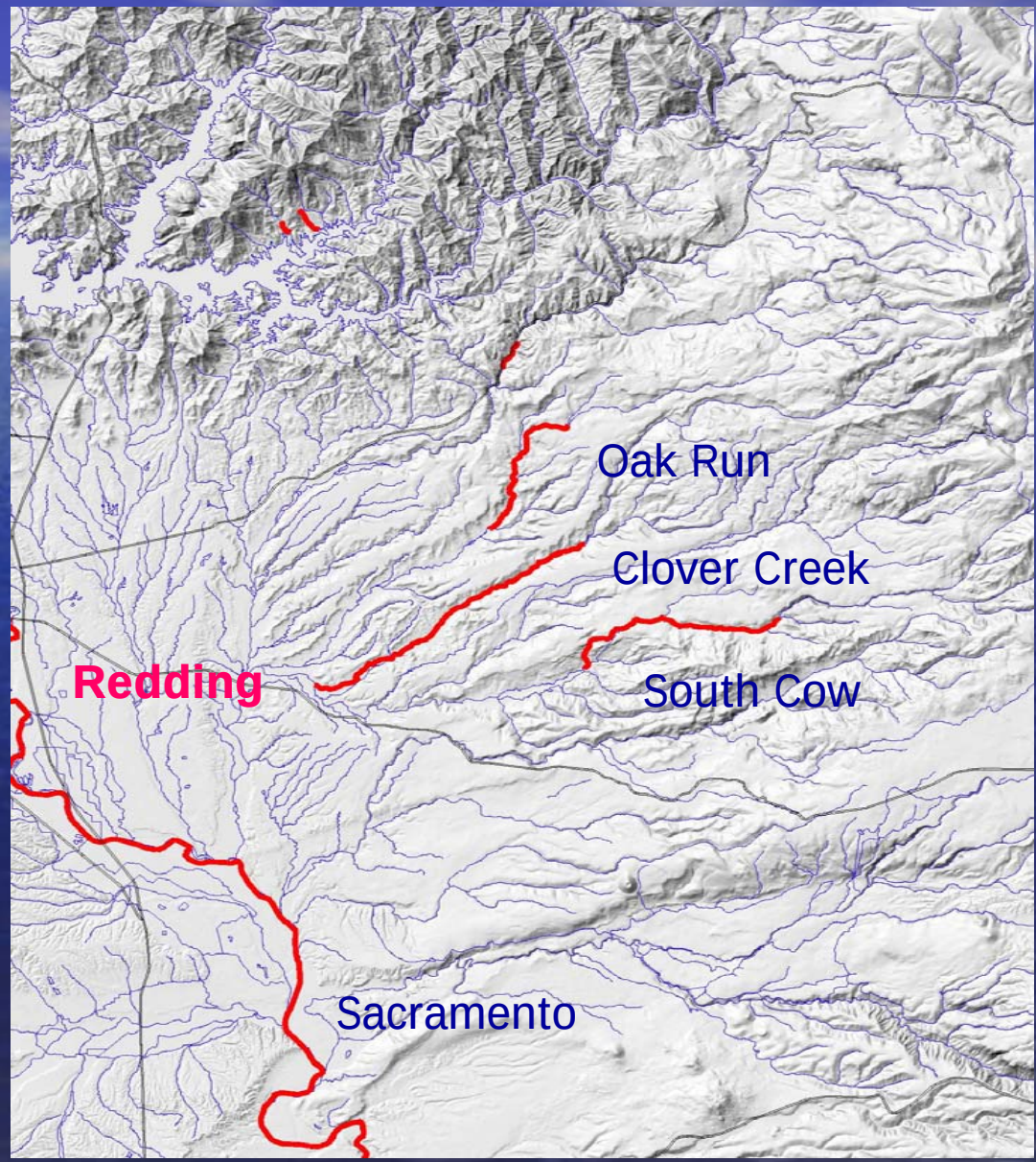
- Guide the watershed's future through local participation and influence
- Bring much needed funding into the watershed for projects
- Provide education and outreach to watershed residents, landowners and businesses
- Assist other organizations in the watershed accomplish their projects
- Be a voice to maintain the rural way of life in the watershed

Partners In Water Quality Improvements

- Central Valley Regional Water Quality Control Board
- California Department of Fish and Game
- National Resource Conservation Service
- California Department of Water Resources
- United States Fish and Wildlife Service
- Bay Delta Authority
- State Water Resources Control Board

303(d) listing

- South Cow Creek
  - Fecal Coliform (7.9 m)
    - Ag, grazing related, other
- Clover Creek
  - Fecal Coliform (11 m)
    - Agriculture-grazing, other
- Oak Run Creek
  - Fecal Coliform (5.6 m)
    - Combined sewer overflow, agriculture, grazing related sources, pasture-grazing upland natural sources



Tailwater Project Goals

- Capture irrigation runoff from tailwater ditches
- Improve water quality including reduced turbidity and fecal coliform prior to water release
- Potential for reduction in water temperature.

Location of Tailwater Pond

- Technical Advisory Committee
- Two Locations
  - Considerations
    - Willing landowners
    - Ability to use project as a demonstration project
    - Applicability to other projects
- Project site selected on a ranch a ¼ mile from Old Cow Creek

Scope of Work

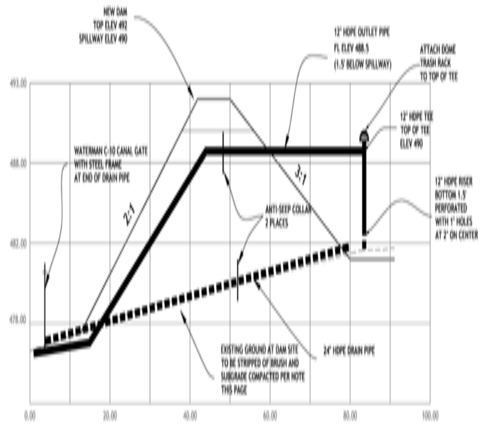
- Topographic surveys of the pond location
- Hydraulic study to determine size of the tailwater pond
  - In this case the pond site dictated the pond size with a surface area of 0.25 acres and a capacity of 1.25 acre-feet
- Permit development
- Design plans and specifications
- Engineers estimate of cost

Tailwater Pond Design

- NRCS guidelines utilized for the design of the pond (USDA, NRCS Agriculture Handbook Number 590)
- Within an ephemeral drainage channel downstream of wetland (delineated and protected)

Design Continued

- 14 foot height
- Face of Dam 2H:1V
- Sides of Dam 3H:1V
- 24 inch drain pipe with valve installed for post irrigation draining of pond
- 12 inch riser pipe perforated on the lowest 1.5 feet will drain water from bottom of pond
- Design of spillway and drain pipe is for 25 year, 24 hour storm



SECTION A-A'

HORIZONTAL SCALE: 1" = 10'

VERTICAL SCALE: 1" = 5'

NOTES:

1. ALL FILL MATERIAL SHOULD BE APPROVED BY THE ENGINEER. THE MATERIAL SHOULD BE A SOIL OR SOIL-ROCK MIXTURE WHICH IS FREE FROM EXCESSIVE ORGANIC MATTER OR OTHER DELETERIOUS SUBSTANCES. THE FILL MATERIAL SHOULD NOT CONTAIN ROCKS OR LUMPS OVER 6 INCHES IN GREATEST DIMENSION AND NOT MORE THAN 15% LARGER THAN 2.5 INCHES. IN ADDITION, THE MATERIAL SHOULD CLASSIFY AS MODERATELY EXPANSIVE (PI VALUE OF 15 OR GREATER AS DETERMINED BY ATTERBERG LIMITS TESTING, ASTM D4318). SCREENING OF THE MATERIAL TO REMOVE ROCK MAY BE REQUIRED.

2. EMBANKMENT (DAM) AREA SHALL BE CLEARED OF VEGETATION AND SUBGRADE COMPACTED TO 90%. EMBANKMENT MATERIAL SHALL BE PLACED IN 8-INCH LIFTS AND BE COMPACTED TO 90% OF MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D1557. MOISTURE CONTENT AT THE TIME OF PLACEMENT SHALL NOT EXCEED 2% ABOVE OR 3% BELOW OPTIMUM. CONTRACTOR SHALL SUBMIT A COMPACTION REPORT PREPARED BY A QUALIFIED REGISTERED SOILS ENGINEER, VERIFYING THAT ALL FILLED AREAS HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS.

3. DRAINAGE PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) SMOOTH INTERIOR PIPE AND FITTINGS IN CONFORMANCE WITH AASHTO M294 TYPE S.

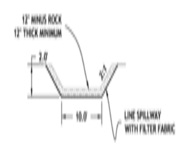
4. CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY EROSION CONTROL DURING CONSTRUCTION ONLY. PERMANENT EROSION CONTROL TO BE PROVIDED BY OTHERS.

5. SPILLWAY TO BE LINED WITH RSP (12" MINUS) FROM TOP OF DAM TO FLOWLINE OF EXISTING STREAM BED.

6. CONTRACTOR WILL BE REQUIRED TO CROSS AN IRRIGATION DITCH. ANY DAMAGE TO THE IRRIGATION DITCH SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND OWNER.

7. REMOVED VEGETATION FROM THE PROJECT AREA SHALL BE STACKED IN SMALL PILES WITHIN THE PASTURE AT LOCATIONS DETERMINED BY THE OWNER. THE OWNER WILL BURN PILES DURING RAINY SEASON AFTER CONSTRUCTION HAS BEEN COMPLETED.

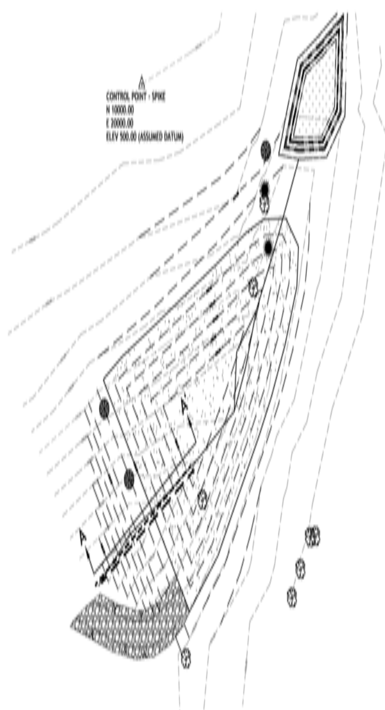
8. FENCING SHALL CONSIST OF "T" POSTS WITH 4 STRANDS OF 4-POINT BARBED WIRE AT THE APPROXIMATE LOCATION SHOWN ON THESE PLANS.



SPILLWAY DETAIL

HORIZONTAL SCALE: 1" = 10'

VERTICAL SCALE: 1" = 5'



CONTROL POINT DIAGRAM

SCALE: 1" = 30'

CONTROL POINT - SPIKE
N 9734.48
E 20045.57
ELEV 494.31 (ASSUMED DATUM)

VESTRA
962 MARAGLIA STREET
REDDING, CALIFORNIA 96002
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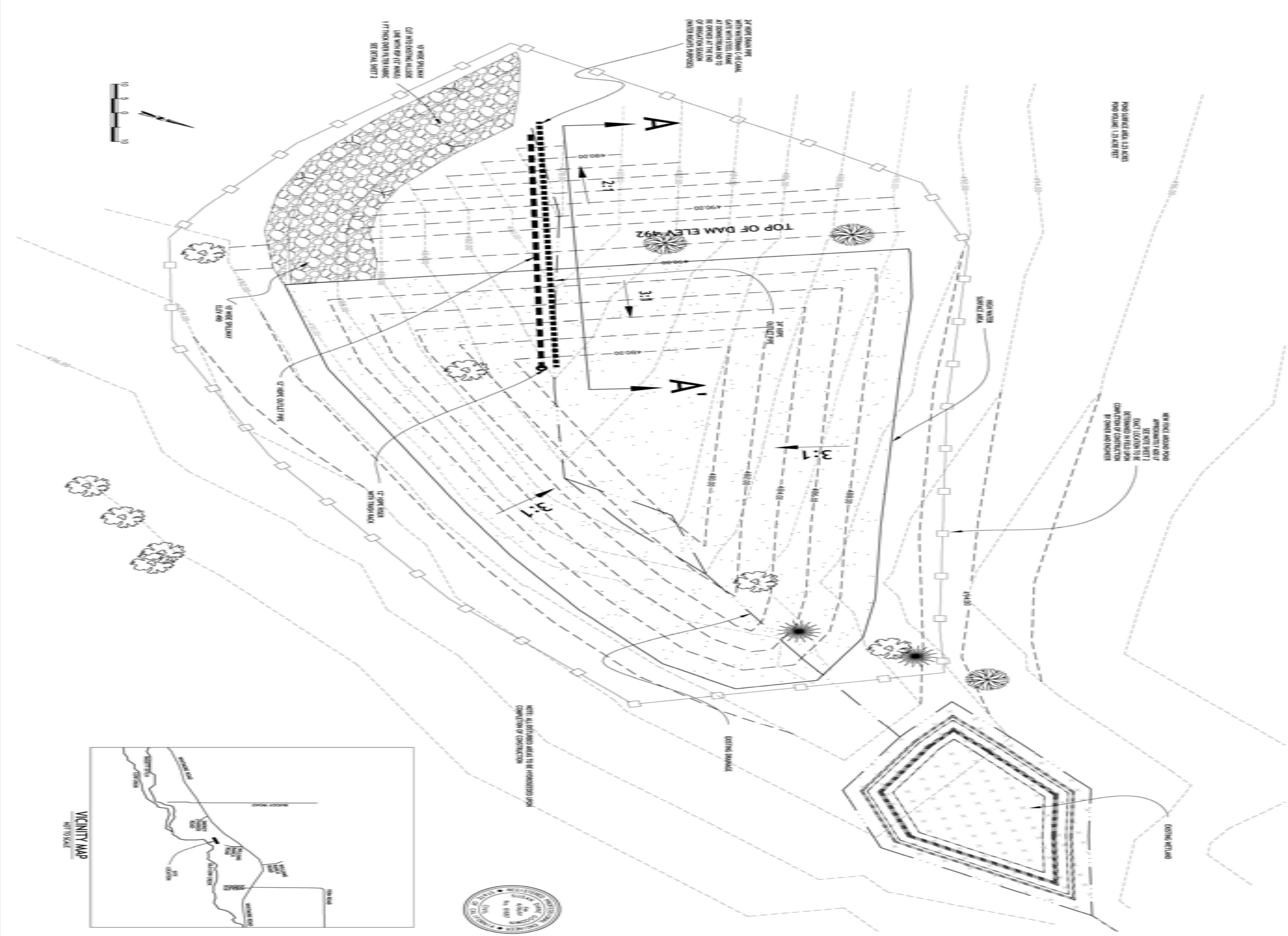
(530) 223-2585
FAX (530) 223-6985

TAILWATER COLLECTION POND
WILLIAMS RANCH
SHASTA COUNTY, CALIFORNIA

SHEET 2 OF 2

DATE 08/05

JOB NO. 70526



SHEET 1 OF 2	TAILWATER COLLECTION POND WILLIAMS RANCH SHASTA COUNTY, CALIFORNIA	DSGN: SG DR: SG CHK: SG APVD: SG	NO. / DATE / REVISION / BY

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VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Monitoring

- QAPP Development and Data collection methodology that matches other water quality sampling currently underway
- Temperature, E. coli, turbidity, settleable solids, TDS, nitrate, phosphate, pH, dissolved oxygen.

Expected Benefits

- Reduced E. coli
- Reduction or no increase in water temperature
- Reduction in turbidity
- Complete technical package for other interested parties.

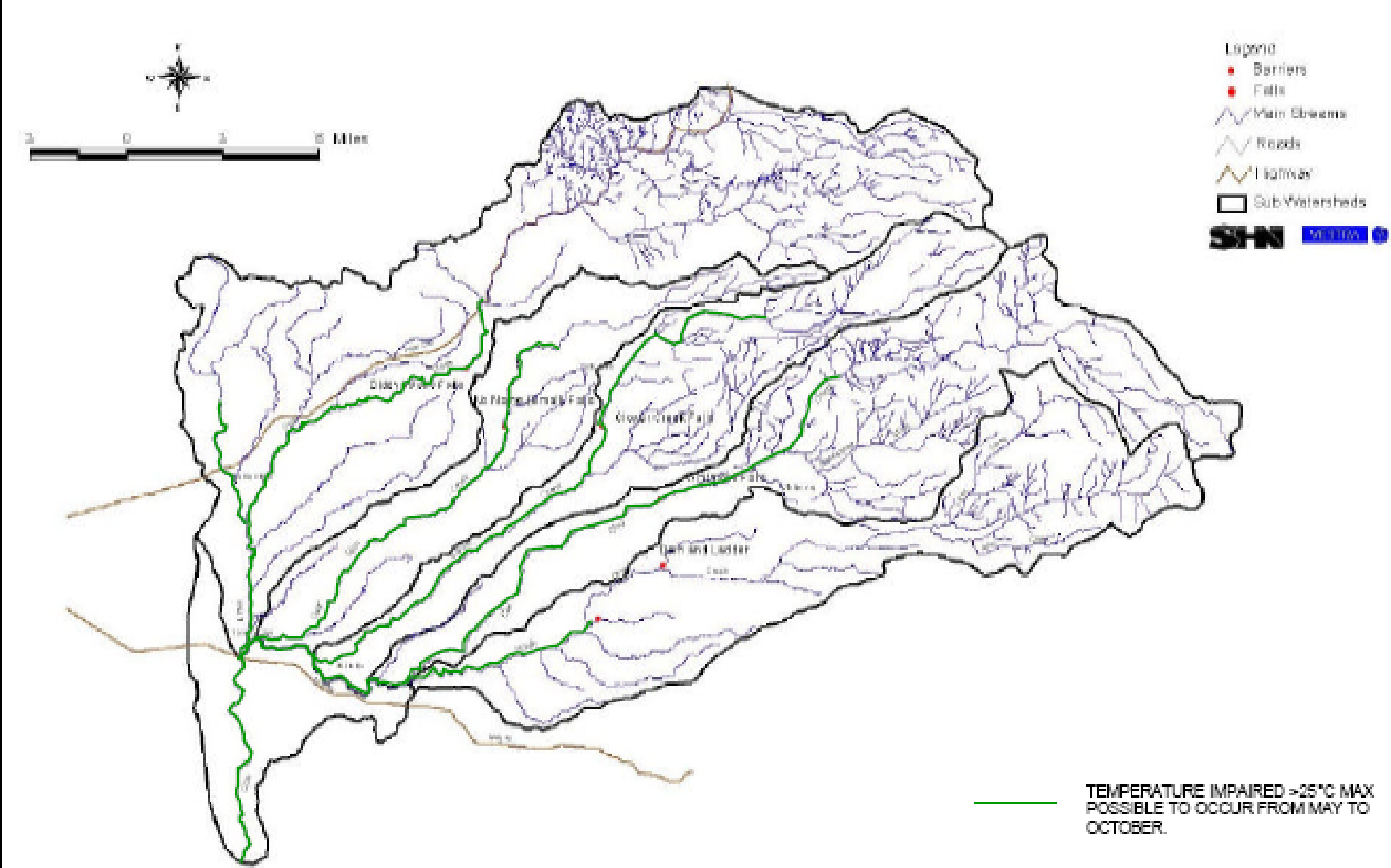


FIGURE 6-4
TEMPERATURE IMPAIRED SEGMENTS
COW CREEK WATERSHED ASSESSMENT
SHASTA COUNTY, CALIFORNIA

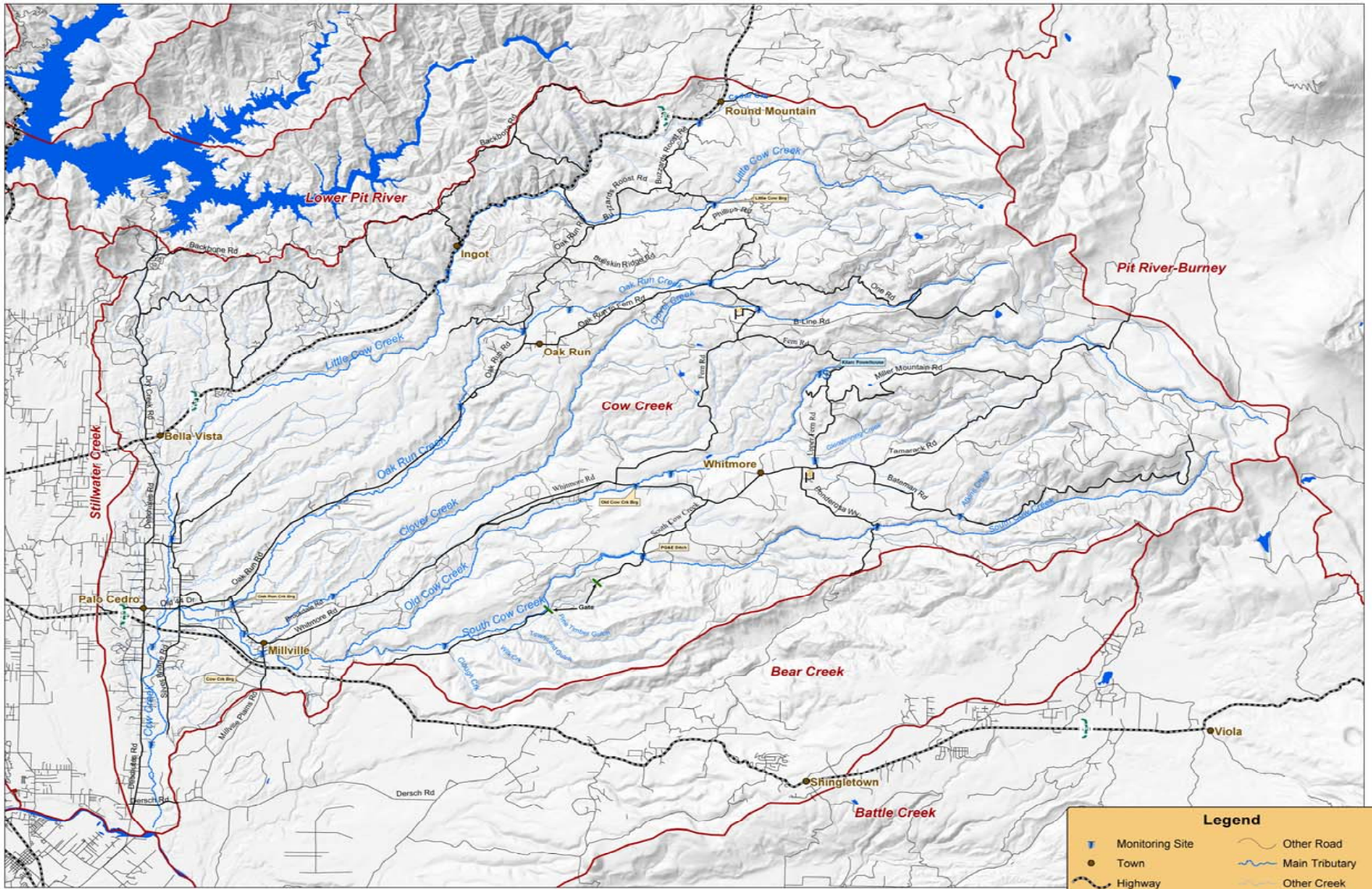
Reference: DWR

Water Quality Monitoring

- 21 locations in the watershed
- Low, middle and upper elevations
- E coli and temperature

Cow Creek Watershed

Water Quality Monitoring Stations, Spring 2004



Updated July 7, 2004
Western Shasta RCD
Sources: DFG, CA RWQCB
Watershed Information Model (WIM)

Ditch Piping Feasibility Studies

- A limited topographic survey of portions of the ditch to determine the overall slope;
- Hydraulic analysis of the existing and proposed systems based on size and slope of ditch, type of pipe to be used, current amount of water being diverted and total allotment;
- A field verification of the condition on the existing ditch, including any problem areas that may require additional engineering;
- An estimate of the amount of water loss during ditch transport and through loss from vegetation to determine water savings by piping/lining the system;
- Determine possible water saving alternatives for irrigating, such as sprinklers vs. flood irrigation, where conditions allow and systems have not already been established;
- Work with governing agencies to outline a protocol for the dedication of water for in-stream use without the abandonment of water rights by the water rights holder;
- Determination of the permits required for construction;
- A cost estimate including engineering, permitting and construction costs;

Expected Benefits

- Increased water quality
- Viable Best Management Practices
- Demonstration project for Watershed
- Implementation information for landowners
- Public awareness of BMPs
- Excellent agency-landowner interaction and relationship building
- Increased landowner awareness of funding available to help implement projects
- Large landownership participation

Outcomes

- Increased water quality awareness
- Demonstration projects with technical information available to landowners
- Baseline data to track trends in water quality
- Removal of the tributaries from the 303d list

Watershed Approach

- Locally driven effort
- Better support from landowners
- Focus on local issues and solutions
- Development of working relationship with agencies
- The expected outcome of increased water quality
- Remember 1/3 Rural Residential, 1/3 Agriculture and 1/3 Timber